ENVIRON

July 15, 2004

Mr. Dion Novak
Superfund Division
United States Environmental Protection Agency
77 West Jackson Boulevard
Mail Code: SR-6J
Chicago, IL 60606

Re: Response to Comments
Draft Screening Level Ecological Risk Assessment
Eagle Zinc Company Site, Hillsboro, Illinois

Dear Mr. Novak:

As requested in the letter from Thomas Krueger, Esq. to Ross Jones, dated June 8, 2004, this letter provides detailed responses to the U.S. Environmental Protection Agency's (EPA's) May 3, 2004 comments concerning the March 2004 draft Screening Level Ecological Risk Assessment (SLERA) for the Eagle Zinc Company Site in Hillsboro, Illinois (ENVIRON 2004). The draft SLERA was submitted to EPA on March 17, 2004. These responses reflect agreements reached with EPA and/or CH2M Hill personnel on behalf of EPA during our June 2, 2004 meeting, as well as during telephone conversations and other communications with Mr. Ryan Loveridge of CH2M Hill on June 11, July 7, July 8, July 9, and July 14, 2004.

These responses to comments are meant to provide EPA with the information and technical detail necessary for the Agency's concurrence with revisions to the draft SLERA that, to maintain consistency with the RI/FS Work Plan (July 2002), will be re-titled the Ecological Risk Screening Evaluation (ERSE).

Among the comments provided by EPA was a requirement that the revised document add an evaluation of risks posed to on-Site aquatic and on-Site terrestrial receptors to the existing evaluation of risks posed to off-Site aquatic receptors. Because this requirement essentially triples the amount of quantitative risk evaluation in the document and necessitates significant structural changes to the draft SLERA, this letter does not provide specific edits or revisions to the draft SLERA. Rather, it provides a clear roadmap describing the specific quantitative methodology(ies) that will be used in revising the document.

EPA's comments are restated below followed by ENVIRON's responses.

GENERAL COMMENTS:

A major insufficiency in the SLERA was the lack of assessment of on-Site terrestrial and aquatic receptors. This was communicated by EPA to the Parties at the February 2004 meeting.

The reasons for this omission included the future land-use, the size, quality, and type of on-Site habitat, and the value of the on-Site ecological resources to be protected. Because the intended future land-use on-Site will be commercial/industrial, it is suggested in the SLERA that evaluation of the ecological receptors on-Site is not necessary. It is advisable to evaluate all current conditions in the SLERA, such that risks will be understood should development not occur in a timely fashion. Ready-for-Reuse (RfR) Determination (USEPA, 2004) was indicated as a key component in the development of the Site. In the RfR guidance (USEPA, 2004), RfR Determination will not occur until, "*the site meets CERCLA standards of protectiveness.*" Because the current level of risk on-Site has not yet been determined and the time until development is uncertain, the CERCLA standards of protectiveness will not be met. RfR determination also does not guarantee that development will occur, therefore, adverse ecological effects, if present would continue.

Furthermore, the area of development has not been presented, but if it is limited to only the former Buildings and Manufacturing Area, a large area on-Site that provides habitat to ecological receptors will not have been assessed and appropriately addressed.

Inadequacies in the size, quality, and type of on-Site habitat were also cited as a reason not to evaluate on-Site ecological receptors. The following excerpt from the SLERA summarizes the decision not to assess on-Site receptors: (Page 23; Paragraph 4) "... *the available on-Site habitat is not of the size, quality, and type that is supportive of sustainable wildlife populations, communities, and ecosystems.*"

The habitat on-Site is of a sufficient size to evaluate risk to ecological receptors from current- and future-use. As defined by USEPA (1997), habitat is a, "*Place where a plant or animal lives, often characterized by a dominant plant form and physical characteristics.*" This area is partitioned into habitats in Figure 4-2 of the SLERA by the dominant plant forms (woods, mixed woods, and old field) and is connected to adjacent off-Site areas of similar habitat. Note also that the adjacent land to the north and south of the western drainage way area was described as good songbird habitat in the SLERA (Page 18; Paragraph 1). Terrestrial habitat of this size could support a terrestrial wildlife community of songbird and small mammal populations as defined by the USEPA (1992) definitions of community ("*An assemblage of populations of different species within a specified location and time*") and population ("*An aggregate of individuals of a species within a specified location in space and time*").

Rather than estimate the number of individuals of a species on-Site, SLERA guidance dictates conservative assumptions, as noted in the following excerpt:

"*For the screening level exposure estimate for terrestrial animals, assume that the home range of one or more animals is entirely within the contaminated area, and thus the animals are exposed 100 percent of the time.*"

This conservative assumption captures a scenario where the Site acts as a "sink" (adverse effects, including lethality, occur in individuals exposed to on-Site contaminants) for regional populations of migratory and resident populations of birds and mammals.

The community and terrestrial habitat area should also be considered an ecosystem according to USEPA (1997) definition ("*The biotic community and abiotic environment within a specified location and time*"). According to the USEPA definitions, an aquatic ecosystem on-Site consists of community of fish, amphibians, and invertebrate populations in the southwest Pond and drainage ways.

The lack of valuable ecological resources was also presented as a reason for not evaluating on-Site receptors. For example, although deer and raccoon were observed on-Site, they were described as "*often considered nuisance species*" that "*do not constitute valuable ecological resources as defined in EPA guidance (EPA, 2001).*" Note that the citation (which should be corrected to EPA, 2001a) is a discussion document and not actual USEPA SLERA guidance. However, in this discussion document "valuable" ecological resources were not defined, but game species, such as white-tailed deer, were considered of societal value. Species with societal value were also listed as a possible criterion to identify ecological entities to protect in another cited USEPA discussion document (USEPA, 1997b). This criterion was listed in the SLERA, along with "ecological significance," for which examples were not given, but would include lower trophic receptors such as invertebrates that are expected on-Site.

USEPA SLERA guidance (USEPA, 1997) has assessment endpoints as any adverse effects on ecological receptors, where receptors are plant and animal populations and communities, habitats, and sensitive environments. Subsequently, the following changes (and subsequent modifications) to the SLERA are needed:

- Assessment of effects to on-Site terrestrial receptors. Terrestrial receptors may include, but are not limited to invertebrates, white-tailed deer (herbivorous mammals), American robin (omnivorous birds), and the red-tailed hawk (carnivorous birds).
- Assessment of effects to on-Site aquatic receptors. Aquatic receptors may include, but are not limited to, benthic invertebrates, water-column invertebrates, fish, amphibians, raccoons (omnivorous mammals), great-blue heron, and mink.

It is also recommended that two future scenarios be evaluated: development and the status quo. This will provide the decision-makers with the best and most complete information on the environmental aspects of the property upon which to base a decision.

Response: There is no dispute as to the nature of the Eagle Zinc Site – a currently inactive manufacturing facility with several structures, raw material, processing intermediates and process residual stockpiles at various locations on the Site. The scattered vegetation is typical of such sites, and wildlife is not prevented from traversing

the property – again typical of many industrial faculties with a buffer zone between the manufacturing operations and the property boundary. The local government unit of competent authority has zoned the property "industrial" and has not indicated any expectation of change in zoning. There has been no change in ownership since the beginning of the current work. Our mutual approach to the Site and our work to-date have both fully recognized and embraced this reality.

We disagree that the draft SLERA was deficient by not assessing risks to on-Site receptors. As has been discussed, and as presented in the draft SLERA, the Site has been, and it is anticipated that the Site will continue to be, used for industrial purposes. As stated in EPA's 1997 guidance on ecological risk assessment, remediation to reduce ecological risks might not be needed for sites in industrial areas where Site-related impacts might be indistinguishable from non-Site-related impacts, or where contaminant-related impacts are indistinguishable from non-contaminant-related impacts. The Eagle Zinc Site fits squarely into that category, and to conduct an ERA for this Site that does not incorporate reasonable fact-based assumptions about the future use of the Site would be inappropriate.

However, even though we disagree with the rationale presented by EPA for assessing on-Site ecological risks, the revised document will include evaluation of on-Site media and receptors, as follows:

- As discussed and agreed upon during our June 2, 2004, meeting, on-Site aquatic risks will be assessed using the same approach used for the off-Site aquatic receptors presented in the draft SLERA. This includes comparison to water quality criteria for surface water and sediment, and comparison to the "piscivorous" criteria published in Sample et al. (1996) for the great blue heron and mink.

- As presented in EPA's comments, as well as the subsequent Technical Memorandum prepared by CH2M Hill dated June 7, 2004 ("Approach for the Assessment of On-Site Ecological Receptors at the Eagle Zinc Site"), and as the requirements of those two documents were modified by agreement during follow-up communications with CH2M Hill, on-Site terrestrial risks will be assessed by considering exposures via the food web to bioaccumulative constituents (as defined and presented in USEPA, 2000). The receptors to be evaluated by this methodology are the deer mouse, American robin, and red-tailed hawk. Food web modeling will include conservative ingestion dose based estimates in the screening portion of the ERSE, as well as less conservative food web modeling input parameters in the baseline portion of the document (as, and if, necessary for specific constituents).

As agreed-upon with Ryan Loveridge on July 8, 2004, on-site risks will be evaluated separately from off-site risks. Further, on-site risks will only be evaluated using on-site data; similarly, off-site risks will only be evaluated using off-site data. In addition, as agreed at the June 2, 2004 meeting, only the current use scenario will be evaluated.

SPECIFIC COMMENTS:

Many of the changes to the SLERA that are necessary because of the General Comments were not included in the Specific Comments. An assessment of on-Site receptors in the SLERA will result in numerous changes that are not listed below. Note also that changes in Sections 2 to 9 should also be reflected in the Executive Summary.

1. *(Note: from page 3 of EPA letter)* Page 1 par 3. See comment made for human health risk assessment regarding future site use.

   Response: (from Page 3). ENVIRON respectfully disagrees with the Agency's statements about future Site use as it pertains to assessing ecological risks. See the response to the General Comments as well as the letter dated June 29, 2004 from me to you responding to EPA's comments on the draft Human Health Risk Assessment.

2. *(Note: from page 3 of EPA letter)* Page 2; Bullet 1: Remove or modify the description of the habitat as "*unremarkable*" because it is ambivalent does not have direct relevance to the evaluation of potential ecological risk (the fact that no "sensitive habitats" are present is directly relevant) and it implies that only distinctive habitats qualify for Ecological Risk Assessment, which is not correct.

   Response: By agreement with EPA, the revised document will include a screening level portion and, as necessary, a baseline level portion. Statements characterizing the Site as unremarkable will not be presented as part of the screening level portion of the revised document, but may be presented in the baseline portion of the document.

3. *(Note: from page 3 of EPA letter)* Page 3; par 1: Remove or modify the following statement, "Due to marked physical disruption and resultant degradation of habitat on-Site, it does not support wildlife populations, communities and ecosystems." See the General Comments. The habitat on-Site supports wildlife populations, communities and ecosystems. This was confirmed during the March 2004 site visit and is well documented with photographs.

   Response: See Part 1 and Part 2, below.

   Part 1 –Text throughout the report will be revised to indicate that marked physical habitat disruption and degradation of habitat is associated with "on-Site manufacturing areas" and that these areas do not support wildlife.

   Part 2 – ENVIRON respectfully disagrees with EPA's position. While we agree that individual organisms of a variety of species may exist on-Site in areas that were not used for manufacturing, we disagree that these individuals *a priori* constitute a population, community, or ecosystem. For example, red-tailed hawks may occasionally be exposed to on-Site areas, and this species will be included in the on-Site ERES (and, as part of the screening-level efforts, the conservative

assumption that on-Site habitat supports a red-tailed hawk population will be used). However, the revised document will consider information about a species home range, extent of available habitat on-Site, estimated number of individuals (or percent of population), and other factors in the baseline evaluation.

1. *(Note: from page 4 of EPA letter)* Page 3 par 2: Remove or modify the following statement, "T*hus, the available data indicate that Site-related ecological impacts (if any) in the off-Site and Western and Eastern Drainage Areas are spatially limited.*" The statement as written cannot be supported because of the small number of samples (no more than four) sampled within each area designated in Table 4-3. It is also inappropriate to include risk management language in sections that are calculating environmental risks.

   Response: See Part 1 and Part 2, below.

   Part 1 – ENVIRON respectfully disagrees that a limited number of samples automatically disallows the characterization of spatial extent, particularly when non-detections are present in the downgradient portion of a channel. Care will be taken, however, to ensure the proper use of these types of descriptions in the revised document.

   Part 2 – The comment is noted. Risk management language in the Executive Summary, such as spatial discussions, will not be included in discussions related to the screening-level hazard quotient calculations. However, risk management language will be presented in the revised document in sections/passages pertaining to non-screening level aspects of the document.

2. *(Note: from page 4 of EPA letter)* Page 3; par 3: Remove or modify the following statement, "*Therefore, additional information may be necessary to determine what, if any, further evaluation of Off-Site surface water and sediment is warranted for protection of valuable ecological resources.*" This is not a suitable Scientific Management Decision Point. See comment for Section 8 (comment #). It is also unclear what additional information is being referenced here-the purpose of the SLERA is to calculate risks but also to identify additional data necessary to remove or reduce the uncertainties presented here-this has not been done.

   Response: The statement will be modified in the revised document to reflect scientific management decision point terminology provided in Agency guidance on ecological risk assessment, and to provide clear recommendations for the Site.

3. *(Note: from page 4 of EPA letter)* Page 3 par 4: Remove or modify this paragraph. A correctly accomplished SLERA, which this is not, is a *reasonable* worst-case scenario with attended uncertainties and conservative assumptions. It typically over predicts exposure, but it could also under predict exposure.

Response: ENVIRON respectfully disagrees with this comment. A SLERA is not a "reasonable" worst case scenario. However, the word "absolute" will be deleted from the first sentence in the paragraph.

4. Page 10 indented par. In our February meeting, EPA indicated that substantial documentation was required before this statement could be considered for use in the risk assessment-this was not provided. There are several caveats included in this statement which place substantial conditions on future site use. The first is that this scenario is contingent on a mutually acceptable agreement between the site owners and the City of Hillsboro. The second is that the environmental aspects of the property need to be acceptable to both parties before property transfer is completed. This has nothing to do with calculation of risks and is entirely dependent on the final remedy decision at the site, which is well in the future. Therefore, if this statement is to be considered further, the following two stipulations must be included: 1) Institutional controls must be placed on the property immediately by the current owner restricting any future use at the site to commercial/industrial and 2) all conditions that EPA has highlighted in this comment must be removed from this statement from the Planning Commission.

   Response: As stated in the response to the General Comments, the Site is zoned industrial. As you are aware, the Parties are currently actively seeking institutional controls; therefore, the report will be revised to reflect the current status of the property.

5. Page 11 1st two lines. Remove or modify the following statement, "*Therefore, this SLERA is based on the City's and owner's mutual intention that future land use at the Site will remain commercial/industrial.*" A SLERA should be conducted to estimate the likelihood that a particular ecological risk exists. A SLERA should not be performed under only a future land-use scenario and without evaluating the current ecological risks. The intent of risk assessments is to calculate baseline risks under current conditions, which is then used in the FS to develop and screen alternatives.

   Response: The document will be revised to evaluate both screening level and baseline ecological risks; however, the ERSE will continue to reflect that the future land use at the Site will remain commercial/industrial.

6. Page 11; Bullet 3. Remove the statement concerning the level of impact to the Northern Area. The level of impact to this area has not been established in the document.

   Response: The statement will be removed or modified based on the results obtained in the revised report, which will include an evaluation of risk to on-Site receptors. However, it should be noted that all soil data was presented and evaluated in the Phase 1 Technical Memorandum, as well as the sampling methodology, and the scope of the sampling work was initially included in the

SOW attachment to the Consent Order and RI/FS Work Plan and fully approved by EPA.

7. Page 12 par 3. Please note that even though physical stressors may be present on-Site, the contribution from chemical stressors must be fully understood. If, for example, natural events were to alter habitat, the potential for inhibition of vegetative regeneration must be understood. Likewise, the potential for chemical stressors to increase susceptibility to disease should also be understood.

   Response: The comment is noted; however, no revisions are necessary based on the comment.

8. Page 13 par 2. Remove or modify the overall goal of the SLERA ("*ensure that COPECs associated with former Site operations do not adversely impact water quality and habitat conditions in off-Site drainage areas*") because this has not yet been established in the document with a problem formulation or the selection of assessment endpoints. A general goal, such as preservation of ecological integrity or that stated in the Introduction (...."*evaluate whether potential exists for unacceptable risk relative to valuable ecological resources*") would be more appropriate at this point in the document because it does not preclude the problem formulation and the selection of assessment endpoints.

   Response: The statement will be modified in the revised document to indicate that a screening level evaluation is designed to conservatively evaluate whether adverse impacts to wildlife could occur due to former Site-related operations.

9. Page 15 par 1. Change "*as wells*" to "*as well*".

   Response: The typographical error will be corrected.

10. Page 15 Bullet 1. Remove or modify the description of the habitat as "*unremarkable.*" Remove or modify the description of the habitat as "*unremarkable*" because it is ambivalent does not have direct relevance to the evaluation of potential ecological risk (the fact that no "sensitive habitats" are present is directly relevant) and it implies that only distinctive habitats qualify for Ecological Risk Assessment, which is not correct.

    Response: See the response to Specific Comment 2 (from page 3 of the comment letter).

11. Page 16 incomplete par. Remove the comment that terrestrial species observed during the Site visit all have access to superior habitat in the area. Superior habitat off-Site is not relevant to the evaluation of on-Site habitat.

Response: ENVIRON respectfully disagrees, with EPA's comment. Superior habitat is relevant to the evaluation of both on-Site and off-Site species. However, these considerations will not be presented within the screening level portion of the revised document, but will be reserved for the baseline portion of the document.

12. Page 16 par 1. The unknown cause of the tree die-off is another reason to evaluate on-site terrestrial resources because it may be the result of on-site activities.

Response: Please refer to the response to General Comments regarding on-Site ecological risks. The catalpa trees will be specifically addressed in the revised document.

13. Page 16 par 2. The possibility that the undeveloped nature of the northern area attracting ecological resources which would then potentially be exposed to other areas of the site should be evaluated here. It is unclear what point the last sentence is trying to make. Are the only physical stressors on-site related to the residue piles? The two samples in the northern area are not sufficient to rule out any impacts from the residue piles without understanding the potential migration of materials from the piles, which is typically done by modeling movement using available meteorological data, such as wind direction and speed.

Response: ENVIRON respectfully disagrees with this comment. First, the undeveloped nature of the Northern Area is not unique to the environs of the Site; therefore, its so-called "attractive nature" is immaterial. Second, the two samples from the Northern Area used in this evaluation are representative of worst case conditions (as they were sent to the laboratory for analysis because they exhibited the highest XRF responses). Third, previous studies have provided ample evidence that material from the residue piles have not migrated via an air pathway. Fourth, it is noted that EPA fully approved the scope of the additional site characterization effort in the RI/FS Work Plan on July 16, 2002. Finally, EPA did not challenge the adequacy of the Site characterization subsequent to completion of the investigative phases of the RI and prior to the risk assessment phase of the RI. Therefore, the information presented in the paragraph is accurate and will not be revised.

Is more info needed for risk assessment

14. Page 16 par 3. Remove this paragraph. See the General Comments above concerning what wildlife the site could support and the value of this wildlife. Furthermore, common species are not precluded from risk evaluation. In fact, common species are frequently evaluated, often because exposure parameters and toxicology information is readily available. The condition of the former operational areas does not preclude the potential for other habitat areas on-site attracting ecological resources which would then be exposed to the contaminated operational areas through normal movement.

Response: The paragraph will be removed. However, see the response to the General Comments, and note that manufacturing residue material will not be included in the risk assessment (per agreement reached between Roy Ball and you on June 14, 2004).

current status

15. Page 17 par 2. Remove or modify the following statement, "*None of the on-Site drainage features are of sufficient size or quality to support valuable ecological resources. However, the off-Site Western and Eastern Drainage Areas are further evaluated in this SLERA.*" See General Comments above and note that it directly contradicts the statement in paragraph 2, "*In July, basking turtles were observed in the east end of the pond, as well as dragonflies and frogs*" and the statement on page 19, par 3, "*Wildlife observations included whitetail deer tracks, raccoon tracks, turtle burrows, frogs, crayfish holes and an eastern box turtle in a creek burrow.*"

Response: The statement will be removed from the document.

16. Page 19 par 1. Change or remove the following statement, "*The source of the precipitate is unknown, but the fact that it had been observed upstream of the Site on prior occasions suggests that there may be upstream sources or causes of the observed precipitation.*" At the March 2004 Site visit, discoloration was observed to intensify where on-site residue piles were eroding into the drainage. It is also unclear what documentation exists to support the statement that this precipitate was present previously. Is there photographic documentation available?

Response: The statement will be verified and explanation and/or documentation will be provided or it will be modified in the revised document.

17. Page 19 par 2. Include reference or calculations for estimate of 20-fold dilution potential from confluence of tributary to Middle Fork Shoal Creek. See comment 18 above regarding wildlife observations.

Response: The requested information will be provided or the statement will be modified in the revised document.

18. Page 21 par 1. Change or remove the following statement, "*As the off-Site soil samples collected by IEPA in 1993 were well-distributed around the Site, the available data do not indicate that off-Site migration of COPECs through wind deposition has occurred.*" This statement cannot be supported because 1) only 14 off-site soil samples were collected by IEPA in 1993 (two of the 16 samples, X104 and X110, collected by IEPA in 1993 were actually collected inside the site boundaries , and 2) many of the samples collected by IEPA were located upwind (south) of the residue piles. As noted on page 21, par 1, the prevailing wind direction from the site is from the south and southwest.

Response: ENVIRON respectfully disagrees with this comment. The soil data adequacy was already determined at earlier stages of the RI/FS, and determinations that wind deposition is not an issue at this Site have also been made and agreed upon. In addition, the RI/FS Work Plan was approved by EPA on July 16, 2002 and did not propose the collection of any additional off-Site soil samples or the additional evaluation of a dust migration pathway. See, also, the response to Specific Comment 13.

19. Page 22 incomplete par. Change or remove the following statement, "*However, NPDES sampling at the surface water outfalls conducted prior to permit cancellation in May 2003 demonstrated that current conditions on the Site would not result in off-Site impacts.*" The sentence as written cannot be supported. According to the March 2002 Preliminary Site Evaluation Report, chromium, copper, and zinc exceeded Illinois General Water Quality Standards (35 IAC 302 Subpart B) at Outfall 002. It is also unclear whether the NPDES permit required sampling for the same parameters as the RI sampling was done for.

Response: The text will be revised to clarify that discharges from the outfalls were conducted with a NPDES permit, and that federally permitted releases are not the subject of risk assessment activities. In addition, language related to the lack of impacts because permit requirements were met will be removed.

20. Page 22 par 1. Change or remove the following statement, "*The fact that no dissolved metals were detected above applicable groundwater screening levels...*" Dissolved manganese concentrations were detected on-Site at G-102 above the screening level. Is there available water level data that can support the statement that groundwater is "believed" to flow to the SW or E/SW?

Response: ENVIRON respectfully disagrees with these comments. Well G-102 is an upgradient well and downgradient monitoring wells contained manganese concentrations well below Illinois Class 2 GROs and similar to upgradient levels. Water level data supporting ENVIRON's groundwater flow direction determination was submitted to EPA in the November 2003 Phase 2 Technical Memorandum and was not challenged by EPA.

21. Page 22 par 1: Change or remove the following statement, "*Based on the limited off-Site extent of groundwater impacted by dissolved metals concentrations to the southwest of the Site, it is similarly concluded that groundwater discharge is not a significant pathway for the off-Site transport of COPECs to the southwest.*" Only three wells were monitored off-Site in the Western Drainage way and all had dissolved manganese concentrations that exceeded screening levels.

Response: ENVIRON respectfully disagrees with these comments. Well G-102 is an upgradient well (the water level data in the Phase 2 Technical Memorandum clearly supports the statement that ground water flows to the SW or E/SW) and downgradient monitoring wells contained manganese concentrations well below Illinois Class 2 GROs and similar to upgradient levels. See, also the response to Specific Comment 20.

22. Page 22 par 2. Change the following statement, "*Groundwater discharge to surface water similarly does not appear to be a complete pathway for off-Site transport of COPECs in either the Eastern or Western Drainage Areas*" to "*Groundwater discharge to surface water similarly does not appear to be a significant pathway for off-Site transport of COPECs in either the Eastern or Western Drainage Areas.*"

See previous comment about NPDES sampling data-it does not appear to support this statement due to the smaller analytical list.

Response: ENVIRON respectfully disagrees with this comment. Except for manganese, which was also detected in upgradient ground water, the Phase 2 RI data do not suggest surface water impacts associated with off-Site ground water.

23. Page 23 par 1. Remove the comment that terrestrial species observed during the Site visit all have access to superior habitat in the area. Superior habitat off-Site is not relevant to the evaluation of on-Site habitat nor is there evidence to support this statement presented in this SLERA.

Response: See the response for Specific Comment 11.

24. Page 23 par 3. Remove or modify the following statement, "*Of these eight ecological entities, the only one potentially relevant to the Site is off-site aquatic communities in the Eastern and western Drainage Areas.*" Aquatic communities, native species and their habitats, and wetlands are present on-Site.

Response: The statement will be modified to indicate that aquatic communities, terrestrial wildlife/habitat, and wetlands are present on-Site.

25. Page 24 incomplete par. Change or remove the following statement "*On these bases, evaluation of potential chemical to on-Site aquatic and terrestrial resources was not considered to be an appropriate objective for the SLERA.*" This is disputed in the General Comments above. On-site resources should be evaluated. The reference to Reilly Tar in Indiana is not a good one as habitat was destroyed by previous industrial operations, which is not the case at the Eagle Zinc site. List the specific provisions in the guidance (USEPA 1997) used to determine that relevant and/or significant are not present on-Site. These provisions could not be identified.

Response: See the response to General Comments regarding on-Site ecological risks.

26. Page 24, par 4. Because VOCs were detected on-site they should be considered COPECs and compared to screening guidelines.

Response: VOCs will be considered in the evaluation of on-Site ecological risks (however, as agreed to by Ryan Loveridge of CH2M Hill, only bioaccumulative constituents will be evaluated as part of the terrestrial food web modeling efforts).

27. Page 25, Bulleted list of COPECs: Add manganese and the VOCs to the list. See, also, the response to the General Comments.

Response: Manganese and VOCs will be considered in the evaluation of on-Site ecological risks. See, also, the response to Specific Comment 26, and the response to General Comments.

28. Page 26 par 1. Where is the justification for the statement regarding endangered species and what is meant by the statement that off-site areas are too small to support habitat-if this is being used to discount off-site contamination and its impacts on ecological resources, this must be modified or removed.

Response: The justification for the statement pertaining to endangered species is presented in Section 4.1 and in Appendix A, which document information received from the Illinois Department of Natural Resources and reconnaissance observations by our biologists. Also, the statement that off-Site areas impacted by historical releases are too small to provide important habitat for game species is considered accurate. The scale of impacted area versus available habitat will not be included in the revised screening level portion of the revised document, but will be discussed in the baseline portion of the document.

29. Page 27 par 2. Change "*While of mink*" to "*While mink*".

Response: The typographical error will be corrected.

30. Page 27 par 3: Change or remove the following statement, "*...these organisms represent species that are likely to receive the highest exposure to COPECs.*" The SLERA exposure estimates for these organisms are the highest for only those organisms with the same exposure routes (piscivores). Other species with different exposure routes may receive higher exposures. This stipulation should be noted to prevent confusion.

Response: The text will be revised to be specific to piscivores.

31. Page 28 par 2. Recommendation is to include benchmarks for COPECs from additional sources if there is no applicable National or Illinois WQC. Specifically, the Secondary Chronic Values (SCVs) from Suter and Tsao (1996) are recommended. COPECs that are not evaluated in the SLERA because benchmarks were not available are carried forward to the BERA.

Response: The Suter and Tsao (1996) Secondary Chronic Values (SCVs) will be used in the revised document if surface water benchmarks are not available from the two primary sources (i.e., the federal or Illinois WQC). After Suter and Tsao (1996), surface water values published by EPA Region 4, then Region 5, will be considered. Surface water COPECs without benchmarks will be carried forward to the baseline portion of the revised document, in which all the sources listed above (and others) will be considered.

32. Page 28; Equation. Include reference or supporting information to indicate if the equation is the regulatory promulgated equation to calculate hardness for Illinois WQC.

Response: The requested information will be provided in the revised document.

33. Page 29 par 2 Appendix E. Recommendation is to include wildlife benchmarks from additional sources if there is no benchmark available in Sample et al. (1996). COPECs that are not evaluated in the SLERA because benchmarks were not available are carried forward to the BERA.

Response: Consistent with discussions with Ryan Loveridge of CH2M Hill, if ingestion dose related benchmarks are not available from Sample et al. (1996), Agency for Toxic Substances and Disease Registry (ATSDR) and primary scientific literature will be considered for use on a constituent-specific basis. COPECs without benchmarks will be carried forward to the baseline portion of the revised document, in which all the sources listed above (and others) will be considered.

34. Page 31 bullets 1 and 2. Recommendation is to re-name the "*off-Site Background*" areas to prevent confusion with those background areas identified in Section 4.1.2.3. The off-site Background locations have not been to shown to have concentrations unrelated to off-Site releases. In the Western Drainage way, the WD-11 location is approximate, and the WD-10 location may be impacted by erosion of on-Site residue piles. In the Eastern Drainage way, the ED-11 location is only approximately 100 feet north of the Site boundaries.

Response: While ENVIRON agrees with area nomenclature modifications needed for clarity, we respectfully disagree that background location WD-11 (upstream of the confluence with unnamed tributary) is "approximate" and that locations WD-10 (upstream/south of the Site) and ED-11 (upstream/north of the Site) may be impacted by the Site. The background locations for surface water and sediment sampling were proposed in the RI/FS Work Plan and Phase 1 Technical Memorandum and were fully approved by EPA. ED-11 is located upgradient (across Smith Road) from all on-site areas where storm water may flow to the Eastern Drainageway. The location shown for WD-11 was plotted using a GPS location and therefore is in no way "approximate." This location is sufficiently upstream of the confluence with the drainage channel from the Site to make it an appropriate background location. Finally, WD-11 is located in an intermittent stream on the Hixson Lumber property that flows close to the southern Site boundary. However, it is topographically separated from Site surface drainage by an embankment that is at least 10 feet high (a former railroad grade). Therefore, there is no possibility that storm water runoff from the Site enters this channel either in the vicinity of or upstream (east) of location WD-10.

35. Page 31 bullet 3. Please provide a description of the East off-Site far field (Lake Hillsboro) sample data. These data are used to interpret trends in the SLERA, but no information is provided to determine their usability, such as sample locations in the Lake, conditions during the sampling events, sampling methodology, and detection limits.

Response: The East off-Site far field sample was not collected from Lake Hillsboro, but in the drainage just before it enters the lake (see the Phase 1 and

Phase 2 Technical Memoranda for information related to sampling methodology, detection limits, etc.).

36. Page 33 Section 7.1. Add comparisons of sediment data to classification levels presented in IEPA's *Evaluation of Illinois Sieved Stream Sediment Data; 1982-1995 (1997).*

Response: The referenced document will be reviewed and comparisons will be presented where appropriate.

37. Page 34 Section 7.1.1: Include a summary of the exceedances for manganese that are missing from Table 7-1 because other exceedances are also described. See comments for Table 7-1 and Appendix G below. A pattern of decreasing contaminant concentrations with distance as little relevance to whether there is ecological risk. Because no calculations were provided, these claims are unsupported. It is also irrelevant whether Environ thinks that the exceedances are significant or not, as risk is calculated with all exceedances.

Response: ENVIRON respectfully disagrees with these comments. As normally accepted and approved by EPA, exceedences are only considered to be present if the HQ is greater than 1 (using one significant figure). Accordingly, there is no need to discuss manganese here. Also, we disagree with the statement in the comment that risk gradients or trends are of little relevance to whether there is ecological risk; however, discussion pertaining to gradients and trends will be moved to sections subsequent to the screening level portion of the document. Finally, we disagree that discussion of the significance of exceedences is irrelevant, especially in association with a baseline evaluation.

38. Page 34 par 2. Change or remove the following statement, "*A slightly elevated HQ for aluminum was observed in far field sediment, but not in surface water, and in neither medium at the near field and background locations.*" See comments for Table 7-1 and Appendix G below. The calculations to support this statement are incorrect.

Response: Calculations will be verified in the revised document. Corrections will be made, if necessary.

39. Page 34 par 5. Change or remove the following statement, "*The zinc HQ for sediment was also greater than 1 at the background west location (the only exceedance observed in either medium there).*" An exceedance was observed in surface water but the detection limit was too high. See comments for Table 7-1 and Appendix G below.

Response: Calculations will be verified in the revised document. Corrections will be made, if necessary. Potential risks related to non-detects will be evaluated as part of the Uncertainty Assessment, as is standard practice normally accepted and approved by EPA.

40. Page 34 par 6. Change or remove the following statement, "*Copper, lead, and manganese HQs were all slightly elevated in near field sediment, but not surface water, while the HQ for nickel was slightly elevated in near field surface water but not sediment. These low exceedances in one medium...*" The nickel HQ in sediment at this location exceeded one. See comments for Table 7-2 and Appendix G below.

Response: ENVIRON respectfully disagrees with these comments. As normally accepted and approved by the Agency, exceedences are only considered to be present if the HQ is greater than 1 (using one significant figure).

41. Page 36 par 1. Change or remove the following statement, "*The fact that similar exceedances for aluminum were observed in both background and near field suggest that the presence of this metal is not Site-related.*" The off-Site background location should not be considered as having concentrations unrelated to on-Site concentrations, or vice versa, because it is only approximately 100 feet off-Site. See SLERA comments for page 22, par 2.

actual data may prove otherwise

Response: The background locations for surface water and sediment sampling were proposed in the RI/FS Work Plan and Phase 1 Technical Memorandum and were fully approved by EPA. ED-11 is located upgradient (across Smith Road) from all on-Site areas where storm water may flow to the Eastern Drainageway. The location shown for WD-11 was plotted using a GPS location and, therefore, is in no way "approximate." This location was sufficiently upstream of the confluence with the drainage channel from the Site to make it an appropriate background location. Finally, WD-11 is located in an intermittent stream on the Hixson Lumber property that flows close to the southern Site boundary. However, it is topographically separated from Site surface drainage by an embankment that is at least 10 feet high (a former rail road grade). Therefore, there is no possibility that storm water runoff from the Site enters this channel either in the vicinity of or upstream (east) of location WD-10.

42. Page 36 par 1. Change or remove the following statement, "*No exceedances were observed at the far field location....*" Exceedances were observed for aluminum, cadmium, selenium, and zinc based on non-detects.

Response: ENVIRON respectfully disagrees with this comment. Exceedences were not observed. Calculations will be verified in the revised report and corrections will be made, if necessary. Note that potential risks related to non-detects will be evaluated as part of the Uncertainty Assessment, as is standard practice normally accepted and approved by EPA.

43. Page 36, Section 7.3. Summarize those COPECs that were not evaluated because benchmarks could not be located. These COPECs should be evaluated further. COPECs that not evaluated are automatically carried forward as COPECs to the Baseline Risk Assessment.

Response: The requested information will be provided, and COPECs without benchmarks will be carried forward to the baseline portion of the document.

44. Page 36 par 2. Change the following the statement, "*For this SLERA, a few inorganic analytes were detected at maximum concentrations that are associated with HQs greater than 1.*" To "*For this SLERA, eight inorganic analytes were detected at maximum concentrations that are associated with HQs greater than 1.*"

Response: The statement will be modified in the revised document to specify the number of COPECs with HQs greater than 1.

45. Page 36 par 3. Change or remove the following statement, " *HQs for lead and copper were elevated in sediment but not surface water, suggesting that these metals may not be bioavailable.*" Because hazard quotients for exposures based on ingestion of sediment-dwelling biota were not calculated, this statement can not be supported. Recommendation is to include a ROC that captures this exposure pathway.

Response: The statement will be removed or modified. However, based on the agreements reached during the June 2, 2004 meeting, no new receptors will be added for the surface water pathway.

46. Page 37 par 2. Change or remove the following statement, "*In summary, the results of the SLERA indicate that the potential for adverse impacts to ecological receptors in both Western and Eastern Drainage Areas, if any, would likely be associated with the presence of zinc and cadmium in surface water and sediment, and is of limited spatial extent.*" As stated in the SLERA (Section 7.0 and Table 7-5), there is no clear guidance to interpret the level of risk for COPECs with HQs that exceed one in a SLERA. Because exceedances were observed for several inorganics, all could be associated with adverse impacts. Similarly, the spatial extent should also not be determined using the magnitude of exceedance, as exceedances were also observed in far field locations.

Response: The comment is noted. Issues such as the spatial extent of elevated HQs and other similar issues will not be included in the screening level portion of the revised document, but will be included in the baseline portion of the document, as appropriate.

47. Page 38 par 1. Change or remove the following statement, "*The results of this SLERA indicate that elevated HQs for selected ROCs in the near field Western and Eastern Drainage Areas are related to locally elevated levels of zinc and cadmium in surface water and sediment.*" The local area was not defined, but, if the intention was to describe elevated levels as only in the near field, this statement is not correct because exceedances were also observed in the far field. Furthermore, HQs were also elevated for eight COPECs in the near field and/or far field.

Response: The statement will modified or removed, as appropriate, in the screening level and/or baseline portions of the revised document.

48. Page 38; Paragraph 1: There are only two possible decisions at this point for the Eagle Zinc Site:

1) The information is not adequate to make a decision at this point, and the ecological risk assessment process will continue to Step 3; or
2) The information indicates a potential for adverse ecological effects, and a more thorough assessment is warranted.

The statement that "*Additional information **may** be necessary to determine what **if** **any** further evaluation of Off-Site surface water and sediment is warranted for protection of valuable ecological resources*" (emphasis added) is not an adequate Scientific Management Decision Point.

Response: The revised document will include scientific management decision point language consistent with guidance, either at the end of Step 2 or at the end of Step 3a (or both, as appropriate).

49. Table 7-1: Aluminum/Surface Water/Background West - Change null value to 2.

Response: As discussed on June 2, 2004, and as is standard practice normally accepted and approved by EPA. HQs will be reported to one significant figure. Standard scientific and mathematical rounding principles will be applied (i.e., rounding will occur downward if below a median point, such as 1.4 will be rounded to 1; rounding will occur upward if above a median value, such as 1.6 will be rounded to 2; and rounding will occur to an even number if on a median point, such as 1.5 and 2.5 would each be rounded to 2). Also, potential risks related to non-detects will be evaluated as part of the Uncertainty Assessment, as is standard practice normally accepted and approved by EPA.

50. Table 7-1: Iron/Surface Water/Background West - Change null value to 1.

Response: Potential risks related to non-detects will be evaluated as part of the Uncertainty Assessment, as is standard practice normally accepted and approved by EPA.

51. Table 7-1: Cadmium/Surface Water/Near field - Change from 12 to 8 (and Figure 7-2).

Response: ENVIRON respectfully disagrees with this comment, as we could not reproduce the hardness-based criterion/hazard quotient provided in the comment (note that the equation used requires an input value for hardness that is less than or equal to 400 mg/L). However, calculations will be verified in the revised document, and corrections will be made, if necessary.

52. Table 7-1: Zinc/Surface Water/Near field - Change from 457 to 292 (and Figure 7-1).

Response: ENVIRON respectfully disagrees with this comment. We could not reproduce the hardness-based criterion hazard quotient provided in the comment (note that the equation used requires an input value for hardness that is less than or equal to 400 mg/L). However, calculations will be verified in the revised document, and corrections will be made, if necessary.

53. Table 7-1: Add a row for Manganese and insert a value of 1 for Manganese/Sediment/Background West.

Response: ENVIRON respectfully disagrees with this comment. The HQ for manganese referred to in this comment does not meet the criterion for listing in the table (i.e., the HQ is not greater than 1). Also, see the response to Specific Comment 49.

54. Table 7-2: Remove column for Sediment/Far field to prevent confusion. These data were not available.

Response: If data for this medium are not available or presented in the revised document, the column will be deleted.

55. Table 7-2: Nickel/Sediment/Near field - Change null value to 1.

Response: See the responses to Specific Comments 49 and 50.

56. Table 7-3: Cadmium/Great Blue Heron/Far field - Change null value to 1. What medium are the two piscivores exposed to? This comment also applies to Table 7-4.

Response: See Part 1 and Part 2, below.

Part 1 – ENVIRON respectfully disagrees with this comment. The HQ for cadmium referred to in this comment does not meet the criterion for listing in the table (i.e., the HQ is not greater than 1). Also, see the responses to Specific Comments 49 and 50.

Part 2 –The following footnote will be added to Tables 7-4 and 7-5 "hazard quotients for Piscivores are derived using surface water medium, but reflect exposure to both surface water and ingestion of aquatic prey, per Sample et al., 1996." See Section 5.2 of the Draft SLERA for additional information about the methodology Sample et al. used in the derivation of these criteria (or refer to pages 9-12 and Table 12 of Sample et al. for additional clarification).

57. Table 7-5. There may be impacts to background areas that are not discussed in this SLERA. There is an inconsistency in the table that "tolerance and adaption are not considered directly" and the use of "adaptation" to indicate a lack of risk/effects in background areas. Background comparisons are inappropriate for the SLERA.

Response: The revised report will not include discussion of background in the screening level portions of the revised document, but will include this discussion in the baseline portion of the document. However, as described in previous responses, the background locations were fully approved by EPA. Finally, we do not believe the cited text represents an inconsistency.

58. Figure 4-6: Modify Secondary Transport Mechanism for On-Site Surface Water to Off-Site Fish/Shellfish. It is unclear how "Biotransfer" transports contaminants from on-Site surface water to off-Site fish/shellfish.

Response: Biotransfer will be omitted from Figure 4-6.

59. Figure 7-4: Add bar to Great Blue Heron/Far field/1. See changes to Table 7-3.

Response: ENVIRON respectfully disagrees with this comment (see the response to Specific Comment 49 regarding the appropriate use of significant figures and rounding conventions). However, calculations will be verified in the revised document, and corrections will be made, if necessary.

60. Appendix E. Toxicological Benchmarks for Wildlife: Chromium/Mink - Change from null value to 4.497 for Cr VI (the Cr VI benchmark was used for aquatic life).

Response: The value for hexavalent chromium will be included in the revised report.

61. Appendix E. Chronic Surface Water Criteria for Aquatic Life: Silver/Section 302:208 g Criteria (and criteria for ERA comparison) - Change from 1 to 5. There are Region 5 surface water numbers for cobalt, vanadium, antimony and beryllium, Region 5 sediment numbers for cobalt and Region 4 sediment numbers for antimony and silver.

Response: The benchmarks suggested in this comment, as well as benchmarks suggested in Specific Comment 31, will be included in the document, as appropriate.

62. Appendix E. Chronic Surface Water Criteria for Aquatic Life: Aluminum/CCC (and criteria for ERA comparison) - Change from blank to 0.87.

Response: The revised document will include screening values from sources identified in Specific Comments 31 and 61, as available.

63. Appendix E. Toxicological Benchmarks for Wildlife: Selenium/Mink - Change from 1 to 4.318E-04.

Response: The value for selenium will be included in the revised document.

64. Appendix G. Hazard quotients for aquatic life based on surface water exposures: Adjust the number of significant digits, particularly where "0.00" is listed. TRVs should be included in these tables for sediments.

Response: ENVIRON respectfully disagrees with this comment. Hazard quotients will be reported using one significant figure, and the sediment "benchmarks" that are used to calculate the hazard quotients will be provided on the table. See the response to Specific Comment 49.

65. Appendix G. Hazard quotients for aquatic life based on surface water exposures: Indicate in footnotes what blank cells represent (not sampled or no value available).

Response: The requested information will be provided.

66. Appendix G. Hazard quotients for aquatic life based on surface water exposures: Re-calculate hardness-dependent screening values for East off-Site near field and East off-Site far field (screening values are listed as the same although the hardness differs).

Response: The requested information will be provided.

67. Appendix G. Hazard quotients for aquatic life based on surface water exposures: Re-calculate hardness-dependent screening values in the West off-Site near field (errors were noted).

Response: The values will be verified (note, however, that the equation used requires an input value for hardness that is less than or equal to 400 mg/L).

68. Appendix G. Hazard quotients for piscivores based on surface water exposures: Adjust the number of significant digits, particularly where "0.00" is listed.

Response: ENVIRON respectfully disagrees with this comment. Hazard quotients will be reported using one significant figure. See also the response to Specific Comment 49.

69. Appendix G. Hazard quotients for piscivores based on surface water exposures: Remove screening value and HQs for iron.

Response: ENVIRON respectfully disagrees with this comment. Appendix G (Hazard Quotients for Piscivores) does not include a screening value for iron and there are no HQs listed for the great blue heron or mink for iron. The values

presented in the table are maximum detected surface water concentrations. Footnote "b", which that refers to iron criteria, will be deleted.

70. Appendix G. Hazard quotients for aquatic life based on sediment exposures: Recommendation is to shade all hazard quotients that are greater than one, or indicate in the footnotes that only those that are greater than LELs were shaded to prevent confusion.

Response: The suggestion will be considered in the revised document.

71. Appendix G. Hazard quotients for aquatic life based on sediment exposures: Add shading to Chromium LEL HQ in West-Background Tributary to South of Site.

Response: ENVIRON respectfully disagrees with this comment. Hazard quotients will be reported using one significant figure (see the response to Specific Comment 49); therefore, the value will be less than the criterion for shading.

72. Appendix G. Hazard quotients for aquatic life based on sediment exposures: Add shading to Manganese LEL HQ in West-Background Tributary to West of Site.

Response: ENVIRON respectfully disagrees with these comments. Hazard quotients will be reported using one significant figure (see the response to Specific Comment 49); therefore, the value will be less than the criterion for shading.

73. Appendix G. Hazard quotients for aquatic life based on sediment exposures: Re-calculate all nickel HQs (except the ERL HQ, which was correct) and add appropriate shading in West Off-Site Near field (errors were noted).

Response: Calculations will be verified and, as necessary, corrected prior to submission of the revised document; values will be shaded, as appropriate.

74. Appendix G. Hazard quotients for aquatic life based on sediment exposures: Re-calculate ERL, ERM, TEL, and PEL HQs for zinc in East-Background (errors were noted).

Response: Calculations will be verified and, as necessary, corrected prior to submission of the revised document values will be shaded, as appropriate.

75. Appendix G. Hazard quotients for aquatic life based on sediment exposures: Add shading to arsenic and nickel LEL HQs in East-Off-Site Near field.

Response: ENVIRON respectfully disagrees with these comments (see the response to Specific Comment 49). However, calculations will be verified in the revised report, and corrections will be made, if necessary.

If you have any questions or would like to further discuss any of the responses, please do not hesitate to contact us.

Sincerely,

ENVIRON International Corporation

F. Ross Jones, P.G.
Manager

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